Witness Name: Professor David M. Salisbury

Statement No.:

Exhibits:

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UK COVID-19 INQUIRY

WITNESS STATEMENT OF PROFESSOR DAVID MAXWELL SALISBURY CB FMedSci FRCP FRCPCH FFPH

I, DAVID MAXWELL SALISBURY, will say as follows:

I trained as a Paediatrician in Oxford and at the Hospitals for Sick Children, Great Ormond St., London. I joined the Department of Health in 1986 as a Medical Officer in the Communicable Disease group, was subsequently promoted to Senior Medical Officer and then Principal Medical Officer at which time I had national responsibility for the Immunisation Programme. I was later promoted further into a new post, Director of Immunisation, created specifically for me.

I am a Fellow of the Academy of Medical Sciences, Fellow of the Royal College of Physicians, Fellow of the Royal College of Paediatrics and Child Health, and Fellow of the Faculty of Public Health. I am an Associate Fellow at the Programme for Global Health, Royal Institute of International Affairs, Chatham House, London.

A full CV with an abbreviated list of my publications is attached at Annex 2.

1. UK situation on Pandemic Planning at June 2009.

1.1 A formal UK Pandemic Plan was published in 1994, developed by Dr. Jane Leese, Senior Medical Officer of my team in the Department of Health. The plan covered surveillance and reporting, antiviral supplies, vaccines and public health responses. The first 'Pandemic Influenza Group' met in 1995, chaired by Dr. Jane Leese. This plan was updated in 2007 with the document 'Pandemic Flu - A national framework for responding to an

influenza pandemic' (DMS/01 - INQ000119365) ([ARCHIVED CONTENT] (nationalarchives.gov.uk)).

1.2 In 2002 the English Chief Medical Officer (CMO) had published 'Getting Ahead of the Curve: A strategy for combating infectious diseases', which identified a new pandemic as a particular disease threat (DMS/02 - INQ000119366) [ARCHIVED CONTENT] (nationalarchives.gov.uk).

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1.3 A new Ministerial Committee on Pandemic Influenza Planning (MISC32) met for the first time in December 2005 'to guide the preparations for a potential influenza pandemic and related international activity'. The committee was supported at official level by the cross-departmental Pandemic Flu Implementation Group. The devolved administrations, while not official members, were fully involved in both ministerial and official-level groups.

1.4 Following the increasing awareness of the risks of an influenza pandemic, in part stimulated by the experiences of SARS COV1 and the identification of avian influenza viruses that were killing birds and being transmitted with high fatality rates to humans, preparations were accelerated in terms of UK resilience.

1.5 In 2006, responding to the increasing awareness of the rise of H5N1 influenza virus in birds in multiple geographic locations along with fatal human cases, the Cabinet Office, in conjunction with the Department of Health, published 'Planning for Pandemic Influenza – Guidance for Local Planning'. Within that document is recognition, already stated elsewhere, that pandemic influenza was at the top of the Government's assessment of risks to the UK (page 5) (DMS/03 - INQ000182609) (Draft Check List for LRF Pandemic Flu Plans (publishing.service.gov.uk):

'The Government judges that one of the highest current risks to the UK is the possible emergence of an influenza pandemic – that is, the rapid worldwide spread of influenza caused by a novel virus strain to which people would have no immunity, resulting in more serious illness than caused by seasonal influenza'.

1.6 In the period leading up to June 2009, large stocks of antivirals had been procured, sufficient to treat all of the UK population if infected. Contracts were put in place for supplies of pandemic vaccines following a competitive tendering exercise. These contracts were let with two companies to produce vaccines (one sub-unit virus adjuvanted vaccine and one killed whole virus vaccine) with delivery schedules subject to timing of announcement of a pandemic by WHO, triggering of the UK contracts, and triggering by other countries of their contracts. Small numbers of doses of pre-pandemic vaccine had been stockpiled containing

H5N1 viruses on the assumption that this was the most likely virus to emerge. It was appreciated that vaccine would not be a close match for the eventual H5N1 virus but may give sufficient protection until a matched vaccine could be produced. In the event, the 2009 pandemic virus was not H5N1 but H1N1.

1.7 Department of Health (DH) preparedness plans and pandemic expectations had been shared with relevant industry representatives (banking, insurance, food distribution and food suppliers, funeral directors, telecommunications, military, travel) based on an anticipated first wave affecting all age groups, peaking after around six weeks and ending in around sixteen weeks. A further non-seasonal wave was expected with the pandemic virus subsequently becoming seasonal influenza.

1.8 Outbreak simulation exercises, such as 'Winter Willow (a UK-wide exercise held in January and February 2007 and involving over 5,000 people from government, industry and the third sector) as well as international exercises (see PIWG below) were carried out, organised and managed by Prof. Nigel Lightfoot of the Health Protection Agency.

1.9 As expectations of an influenza pandemic rose over the period up to 2009, so the numbers of members of my team rose. By 2009, there were approximately 35 individuals working partly or wholly on pandemic influenza in the Vaccine Team that I led. These included medical doctors, senior scientific officers, administrators, a pharmacist, communications and publishing experts, vaccine purchase and distribution managers, and informatics specialists.

1.10 By the time of the onset of the 2009 H1N1 Pandemic, the UK was probably one of the best, if not the best prepared country. In her review of the UK Pandemic response of 2010, Dame Deirdre Hine [*DM/1 - INQ000022705*] (The 2009 Influenza Pandemic (publishing.service.gov.uk) noted that :

> 'The majority of the evidence revealed as a result of this process leads me to judge that, overall, the UK response was highly satisfactory. The planning for a pandemic was well developed, the personnel involved were fully prepared, the scientific advice provided was expert, communication was excellent, the NHS and public health services right across the UK and their suppliers responded splendidly and the public response was calm and collaborative. I also found the vast majority of the reporting of the outbreak to have been highly responsible', and
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> 'The pandemic and the response it generated have provided confirmation of the value of planning and preparedness and have demonstrated that the four UK governments can work together effectively and successfully to meet such an

emergency. But the danger of another, more severe, pandemic has not gone away and the governments of the UK must avoid complacency and use this opportunity to learn lessons and make improvements for a future in which resources will be tight'.

2. Joint Committee on Vaccination and Immunisation (JCVI)

2.1 The JCVI originated as a committee to advise on polio vaccination in 1963.It was put on a statutory footing when it became a Standing Advisory Committee, established in England and Wales under the NHS Act 1977. It sat under the Central Health Services Council until 1980. The NHS (Standing Advisory Committees) Order 1981 (SI 1981/597) established the JCVI in its current form as the Standing Advisory Committee on Vaccination and Immunisation.

2.2 JCVI has no statutory basis for providing advice to Ministers in Scotland or Northern Ireland. However, health departments from these countries may choose to accept the Committee's advice or recommendations. Specific advice given by JCVI in response to a request from any one UK health department or Minister is not binding on any of the other Ministers of the Devolved Administrations or UK Government. UK health departments are made aware of all JCVI advice through their designated observers who attend JCVI and Sub-committee meetings and receive committee papers. The Secretary of State is accountable to Parliament for JCVI as a public body. The Minister for Health and Social Services of the Welsh Government has equivalent accountability to the Welsh Parliament.

2.3 JCVI provides advice and recommendations as described in the terms of reference (see earlier) based on consideration of scientific and other evidence (see later) that is used by Government to inform, develop and make policy. JCVI is not a policy maker in its own right and has no regulatory function.

2.4 Since 1 April 2009 the Health Protection (Vaccination) Regulations 2009 place a duty on the Secretary of State for Health in England to ensure, so far as is reasonably practicable, that the recommendations of JCVI are implemented, where those recommendations: a) relate to new provision for vaccination under a national vaccination programme4 or to changes to existing provision under such a programme and b) are made by JCVI (and not therefore a Sub-committee of JCVI) and c) are in response to a question referred to the JCVI by the Secretary of State and d) are based on an assessment which demonstrates cost-effectiveness and e) do not relate to vaccination in respect of travel or occupational health. This duty ceases to apply in relation to a recommendation where JCVI withdraws that recommendation.

2.5 The Chair and members of JCVI play a critical role in ensuring its continued standing as an internationally recognised leading body in the field of immunisation. They bring relevant knowledge, skills and experience to the Committee and contribute to the provision of high quality and well considered advice to UK health departments.

2.6 In practice, the Chair and members are usually appointed for a term of up to three years with expiry at a defined date that may or may not be 31 March. Reappointment of members is not automatic. Subject to conditions including satisfactory appraisal and attendance at meetings, members are usually offered reappointment for a second, or exceptionally a third, term without the post being advertised. This is desirable to retain the expertise and experience of the Committee. However, in accordance with the Code of Practice issued by the Commissioner for Public Appointment, members cannot serve on the Committee for more than 10 years.

2.7 The Committee membership will normally include individuals from academia and practising clinicians who have expertise in one or more of the following areas: • infectious diseases • epidemiology • virology • bacteriology • immunology • vaccinology • neurology • public health • mathematical modelling • health economics • general practice • nursing • paediatrics • management of immunisation programmes. The Committee membership will normally include at least one but preferably two lay members to provide the committee with a wider lay perspective on issues.

2.8 I, as DH Director of Immunisation, was Medical Advisor to the Committee and attended all of its meetings. I was responsible for the agenda, managing the meetings, preparation of the minutes, reporting to Ministers and implementing the recommendations of JCVI.

2.9 By the time of the WHO announcement of the 2009 H1N1 influenza pandemic, the JCVI and its Influenza Vaccine sub-committee had been briefed regularly since around 2005 on the epidemiological circumstances of H5N1 influenza and then H1N1 influenza when that virus had emerged.

2.10 The Committee met five times in 2009 reflecting the need for advice following the emerging epidemiology and state of vaccine development and regulatory processes (licensing).

2.11 The JCVI had received the UK Pandemic Influenza Strategic Plan, developed by Dr. Jane Leese, and had been updated regularly on developments of H5N1 and then H1N1 vaccines (2005 onwards). The Committee was aware of the implementation plans for pandemic influenza vaccination. Under the Chairmanship of Prof. Andrew Hall, the JCVI met in 2009 with the four UK Chief Medical Officers to share the Committee's recommendations

on the use of H1N1 vaccines. Central to this discussion was the importance of vaccination of children since the evidence from early surveillance was highlighting the burdens of infection in children rather than in the previously expected groups of older adults and those with high risk conditions (Minutes of the relevant June JCVI 2009 meeting can be found at Annex 1, priority groups highlighted.)

2.12 In August 2009, the JCVI further reviewed the priority groups for vaccination based on available epidemiology, recommending that the priority order of vaccination should be:

i. Individuals aged between six months and up to 65 years in the current seasonal flu vaccine clinical at-risk groups
ii. ii. All pregnant women, subject to licensing conditions on trimesters
iii. iii. Household contacts of immunocompromised individuals
iv. iv. People aged 65 and over in the current seasonal flu vaccine clinical at risk groups

2.13 The prioritisation for receipt of vaccination was also discussed by the Committee on Ethical Aspects of Pandemic Influenza (CEAPI) that supported the prioritising by age and clinical vulnerability and outlined in the document 'Responding to pandemic influenza: The ethical framework for policy and planning (DMS/04 - INQ000119368) ([ARCHIVED CONTENT] (nationalarchives.gov.uk))

2.14 The JCVI did not have operational responsibilities for the Immunisation Programme: that resided with the Department of Health and respective Departments in Scotland, Wales and Northern Ireland.

3. Scientific Advisory Group on Pandemic Influenza

3.1 I also attended meetings of this group between 2008 and 2009. The group, chaired by Professor Gordon Sir Duff, reviewed the available virology, epidemiology and clinical data on influenza viruses and vaccines, making recommendations on research requirements.

3.2 I did not attend the meetings of the advisory group on mathematical modelling of pandemic viruses (SPI-M) but received regular reports of the conclusions of their meetings.

4. Scientific Advisory Group on Emergencies (UK SAGE)

4.1 The UK SAGE had been proposed and put in place by Dr. David Harper (Chief Scientific Officer and subsequently Director General to c2011). I attended the SAGE meetings

regularly. These, chaired by Prof. John Beddington, were multi-disciplinary meetings that reviewed the then present state of epidemiology and preparedness, reviewed the modelling and made recommendations for further interventions and research. The number of participants was very large, meaning that agenda items could not be explored in great depth. There was little discussion on vaccine relevant issues since so much of the vaccination preparation was already in place.

4.2 However, as the pandemic approached, SAGE viewed it as appropriate to review the JCVI recommendations before the latter's advice was passed to Ministers. Given the vaccine expertise of JCVI and the respective lack of expertise of SAGE, this was unnecessary and time-wasteful.

4.3 My involvement in the SAGE meetings was because of my leadership role in the vaccine response.

5. Other meetings

5.1 I met regularly with the Chief Medical Officer, Health Ministers, including Secretaries of State, WHO Director General, attended COBR(A) meetings when vaccine topics were to be discussed, meetings of the MHRA and EMEA (as was) when vaccine regulatory topics were to be discussed, attended JCVI and its Influenza Working Group meetings, SAGE and other Pandemic Influenza groups (including Cabinet Office and Civil Contingencies Secretariat), and other resilience meetings.

5.2 I was the Senior DH representative at meetings for procurement of pre- and pandemic vaccines.

5.3 I also Chaired frequent meetings of the WHO Strategic Advisory Group of Experts on immunization (WHO SAGE) and I attended meetings of the WHO SAGE Pandemic Influenza Working Group. I briefed the WHO Director General on the recommendations being made by the WHO SAGE.

5.4 Throughout the period of increasing awareness of the risk of an influenza pandemic, up to and beyond the H1N1 pandemic, I had regular meetings with senior executives of all the vaccine manufacturers that had interests in research and manufacturing of pandemic vaccines.

6. UK's Pandemic Preparedness and Resilience at the time of COVID-19.

6.1 Whilst I had been extremely highly involved in the preparation for the 2009 H1N1 influenza pandemic, my observations on this issue (COVID-19 preparedness) are those of an interested external observer. I have not been involved in any way in UK Government pandemic planning since 2014 and have no specific knowledge of what preparations were made after my departure from the Department of Health.

6.2 In 2009, we had very detailed pandemic plans (for an influenza pandemic) in place. These had been tested both nationally and internationally, and we were as best prepared for implementation of mass vaccination as it was possible to be. All of the vaccine resilience had been undertaken through existing Department of Health channels and processes, and it would have been inconceivable at that time that a Vaccine Task Force, outside of the Department of Health, would have been necessary or appropriate. My team and I had worked closely with other Government Department officials, especially in the then NHS Supplies Authority, to put in place Advance Marketing Contracts (sleeping contracts for pandemic vaccine supplies) and we had met regularly with high level representatives of relevant vaccine manufacturers in advance of the contracting process and latterly as we approached the step of triggering the contracts.

6.3 Planning and resilience for an influenza pandemic is tested every year in the form of the seasonal influenza vaccination programme although the seasonal vaccine strain has already been identified based on WHO's global influenza virus surveillance. The UK has the highest vaccine uptake amongst industrialised countries with acknowledged highly effective surveillance and influenza vaccination programme management. Thus, seasonal influenza was used as a model for pandemic preparedness and resilience, and in 2009, the UK was well prepared. The same is probably true for 2020, had the pandemic been of influenza.

6.4 I do not have information of how previous pandemic planning had been updated between 2014 and 2020.

7. Pandemic Influenza Working Group (PIWG) of G7 Countries.

7.1 Following the terrorist attacks on the Twin Towers (September 11th 2001), there was an increasing appreciation of the risks of biological, radio-nuclear and chemical attacks. The G7 countries (France, Germany, Italy, Japan, Mexico, United States, United Kingdom) put together a coalition in the early 2000s – the Global Health Security Initiative. Under its aegis, information was shared between G7 countries at regular GHSI meetings, along with Simulation Exercises including a deliberate release of smallpox affecting G7 countries in which I participated as UK vaccine lead.

7.2 Responding to the notable rise of avian influenza cases of H5N1 virus in the East, along with identification of cases of transmission to humans (Vietnam), the risk assessment for a pandemic of human influenza rose progressively. In response, the GHSI put in place a Working Group dedicated to Pandemic Influenza (PIWG) that I co-chaired with my counterpart from the US Department of Health and Human Services (Dr. Bruce Gellin) from around 2004 to my departure from the Department of Health (end 2013). The PIWG met independently of and along with the main GHSI. We shared pandemic influenza plans including arrangements for vaccines, antiviral medications and other pandemic measures. We also undertook joint Simulation Exercises on Pandemic Flu, on one occasion involving G7 Health Ministers, under the aegis of the EU Commission.

7.3 Although PIWG membership was restricted to the G7 countries, the EU Commission and WHO had observer status. The Chief Medical Officer for Australia was invited to participate in several meetings, particularly those when border closures and quarantine were being discussed. Australia had made clear that its pandemic plan including closing its borders (in and out) and quarantining all those who had gained access into the country after the pandemic had been declared. This was significantly different to the G7 countries who had agreed at Ministerial level that borders in the EU would not be closed in order to allow the unrestricted movement especially of vaccines and other medicinal products. This was of high importance to the UK as it was not self-sufficient for production of influenza (and other) vaccines, being dependent on EU and US producers. Indeed, the UK Advance Purchase contracts for pandemic vaccine had been granted to two Europe-based producers. The approach by the US was different. The US had previously contracted with a UK flu vaccine producer for a large proportion of its seasonal influenza vaccine; production difficulties over one manufacturing seasonal cycle caused large scale vaccine shortages in the US. Thereafter, the US opted to invest in on-shore capacity for seasonal influenza and pandemic influenza vaccine production, avoiding dependence on non-US suppliers.

8. SAGE (UK) Ebola 2014 & 2018

8.1 I do not recall taking part in a SAGE Ebola meeting in 2014 and have no record of this meeting.

8.2 I took part remotely in the Precautionary SAGE meeting on 'Ebola Outbreak in DRC' on 18 May 2018. Topis discussed were Situation update, Vaccines for UK nationals, Epidemiological modelling, Triggers for escalation.

8.3 My involvement was as a vaccine expert and having been Chair previously of WHO's Strategic Advisory Group of Experts on Immunisation (SAGE). I felt that the discussion by those involved was appropriate and well-informed.

9. **Lessons learned**.

9.1 Foremost has to be preparation for the unexpected. Had the COVID-19 pandemic been of influenza, the UK would probably been able to respond effectively building on resilience and planning from the seasonal influenza vaccination programme. Advance Purchase Contracts for influenza vaccine were still in place, surveillance was extremely good, the operating model of primary care implementation would have been used. The result would have been to minimise the impact of a first wave through health service resilience and community resilience with minimising of the impact of subsequent waves through pandemic influenza vaccination. There would have been an expectation that the pandemic virus would eventually take the place of a previously circulating influenza strain and would then be managed through routine influenza vaccination of age and clinical risk groups. Past experience showed that pandemic influenza viruses became seasonal after the first wave.

9.2 However, had an influenza pandemic been of very considerable severity, and vaccine supplies been sufficient, to my knowledge there had not been recent planning to implement vaccination through mass vaccination centres as had to be developed for COVID-19 vaccination. I am not aware that such planning for mass vaccination had been kept up to date.

9.3 On availability of vaccine supplies, always of critical importance in campaign roll-out, the UK would be competing with other countries that also had Advance Purchase Contracts in place. Although vaccine manufacturers have increased annual seasonal flu vaccine production capacity, and have improved their pandemic response capacities, the same problem would persist of demands and supply. Industry was not prepared for a non-influenza virus pandemic.

9.4 On implementation: following heightened anxiety about bio-terrorism in the early 2000s, there was significant concern about deliberate release of smallpox viruses. In addition to ensuring that the UK had sufficient stocks of smallpox vaccine through existing stockpiles and new contracts, and through international simulation exercises, early planning had been undertaken for mass vaccination of the UK population within a very short time period through mobilisation of medical human resources within and outside of normal care settings.

9.5 In 2007, this matter was discussed by JCVI in the context of an H5N1 influenza pandemic that was considered most likely at that time. The committee considered different delivery models, recommending provision through primary care, based on likely prioritisation (matching seasonal influenza criteria) and vaccine supply expectations (DMS/05 - *INQ000119369)* (JCVI Minutes June 2007 highlighted section) [ARCHIVED CONTENT] (nationalarchives.gov.uk). Some members of JCVI had supported the use of mass vaccination centres over primary care administration but the balance of JCVI opinion favoured the use of primary care, building on the seasonal flu vaccination programme and taking into account the likely availability of pandemic vaccine supplies.

I am not aware if such planning for mass vaccination had been kept up to date.

9.6 By the time of the 2009 H1N1 influenza pandemic, there had been an explosion of committees that had interests in pandemic influenza (SAGE, JCVI, JCVI Influenza Sub-group, Scientific Advisory Group on Pandemic Influenza ; SPI-M, Modelling and Operational sub-group (SPI-M-O), Pandemic Flu Implementation Group and many others (detailed in Dame Deirdre Hind's report). All of these committees and working groups needed to be serviced, raising questions for me about the impact of so many groups. A similar explosion, and perhaps even more noticeable, appears to have taken place around the COVID-19 pandemic with apparently casts of thousands being involved across the advisory process. It should be questioned if this was efficient and effective, or time-consuming and not sufficiently impactful for the resources consumed. The work of the Vaccine Task Force was diametrically different. From my experience, it is hard to implement a vaccine campaign by committee and where operational issues are concerned, there needs to be leadership, responsibility and accountability that leads to action.

9.7 There were very clear differences in the way communications were managed during 2009/2010 and in 2020/2022. In 2009 and subsequently, regular media briefings were held, chaired by the Chief Medical Officer. I attended to report and be questioned on vaccine related matters, Prof. John Watson of the Health Protection Agency covered the epidemiology and international comparisons, and the Chief Medical Officer set the context and covered the NHS relevance. To the best of my recollection, no Minister ever attended the media briefings or made public comment on the pandemic, leaving it as a medical rather than politically focussed event. This, clearly, was very different to the handling in 2020/2022. It remains to be seen whether public confidence was better managed with or without the 2020/2022 extent of political engagement. I fully accept that the 2009 pandemic was far milder than anticipated and the scale of the COVID-19 pandemic has been enormous and may have required a heightened way of communication.

9.8 Following the 2012 health service reforms of Andrew Lansley, my team at the Department of Health was in effect disbanded. The role of Director of Immunisation was lost; a small non-expert part of the Immunisation team remained within the Department of Health and other posts were transferred to the then Health Protection Agency and latterly the Health Security Agency. I consider this to have been a mistake for which there was no apparent benefit to preparedness and resilience, along with significant loss of expertise. This was compounded by the fragmentation of roles and responsibilities between the Department of Health, the Health Protection Agency, then Health Security Agency and the NHS Executive.

10. Statement of Truth

I believe that the facts stated in this witness statement are true. I understand that proceedings may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief of its truth.

Signed: Personal Data

Dated: 06/04/2023

Annex 1: JCVI Minutes June 2009

VI. INFLUENZA 18. The Committee accepted the minutes of the influenza subgroup meeting that was held on the 17 March to discuss pandemic influenza but acknowledged that the situation has changed significantly since that meeting.

19. Previously JCVI had stated that the following groups should be targeted for pandemic influenza vaccination:

• health and social care workers, • children under 16 years, and

• vulnerable groups such as those identified for seasonal influenza vaccination (people aged 65 years and over, and the clinical risk groups).

20. These priority groups had not been put in any particular order by JCVI.

21. The likely rate of H1N1 'swine flu' vaccine production means that vaccine will become available over the course of a year. The Committee was informed that if a vaccination campaign was to be implemented then groups would need to be prioritised taking into account the availability of H1N1 'swine flu' vaccine.

22. The Committee was asked, based on the current epidemiology to provide advice on: • the criteria for determining at what point a vaccination programme should begin, and • the prioritisation of the target groups for vaccination taking into consideration the risks and benefits of vaccination against the health risk from H1N1 'swine flu'.

23. The committee recognised that the H1N1 'swine flu' pandemic situation is constantly changing and that the recommendations they make are based on the current evidence. Any significant change in the situation would require JCVI to reassess its advice Epidemiology

24. A paper was presented by the Health Protection Agency on the clinical picture and severity of 'swine flu' (influenza A H1N1v). The majority of cases of influenza A H1N1v are in the younger age groups with less than 5% of cases in those aged over 60. Around 50% of cases are in those younger than 18 years of age. Most cases have experienced mild disease typical of seasonal influenza. 2-3% of cases have been hospitalised and there has been one death to date in the UK. Nineteen cases had been hospitalised in the UK to 10 June 2009. They ranged in age from 14-62 years of age. The committee was also updated on information from other countries.

25. The low number of cases seen in the over sixties is thought to be due to different social mixing patterns in this age group leading to less exposure and previous exposure in this age group to a similar strain of H1N1 between 1918 and 1957 that circulated up to 1957. 5

26. The Health Protection Agency will be carrying out age-specific serological surveys and it was considered important to include antenatal sera in these studies if possible. Modelling

27. Modelling of the current outbreak suggests that the attack rate is up to 30% with an R0 estimated to be 1.5 if there was no intervention. The case fatality rate is estimated to be between 0.1and 0.4% but could be up to 0.9%. The age-specific attack rates of the current outbreak appear to be similar to those seen in the 1957 pandemic. The modelling suggests that vaccinating children who are the main transmitters of the infection would have the greatest effect. The modelling also suggests that if the case fatality ratio is much higher in older people then we should vaccinate this age group; if the case fatality rate is similar across all age groups or increases with increasing age it is still better to vaccinate children to prevent the transmission of disease to the older age groups. H1N1 'swine flu' Vaccines and Regulatory Approval

28. The MHRA updated the Committee on the situation regarding the licensure of H1N1 vaccines. In 2003 the EMEA established a route for the rapid licensure of pandemic vaccines when the WHO declared a pandemic i.e. phase six.

29. The EMEA is currently reviewing its position on the process and timetable for licensing the H1N1 vaccines. The MHRA is currently seeking clarification on whether clinical data will be required in addition to quality data.

30. Both GSK and Baxter are planning clinical trials of the new H1N1 vaccines. First clinical data on the new H1N1 vaccines will not be available until later in the year.

31. The Committee agreed that as clinical data for the H1N1 vaccines would not be available for some time, it would have to advise on the use of the H1N1 vaccines based on the available data from the H5N1 pandemic vaccines. The Committee agreed that the reactogenicity data for H5N1 vaccines would be applicable to the H1N1 vaccines with the antigen change only having a minor effect on reactogenicity. Target Groups

32. The Committee agreed that the primary objective of the vaccination programme should be to reduce morbidity and mortality from the infection. It was considered that, if a second wave of infection occurred in Autumn, preventing transmission was not a feasible objective due to the limited number of doses initially available and attitudinal research, which suggests parents would be less likely to vaccinate their children for the benefit of other sectors of the population. 6

33. Based on the current available epidemiology the Committee advised that the following groups would be most at risk from 'swine flu' infection and should be prioritised for vaccination with H1N1 'swine flu' vaccine in the following order:

a. Individuals aged between six months and 65 years in the current seasonal clinical at-risk groups.

b. Pregnant women in their second and third trimester.

c. Health and social care workers directly involved in patient care in line with the current seasonal flu vaccination programme

d. All children aged from 3 years to 16 years of age

34. JCVI agreed that they would want to consider this list again before final decisions were made about the vaccination programme. The committee recognised that by the time it came to broadening the recommendation to all children aged three to 16 years there would be a significant amount of experience from vaccinating at risk children. [discussions of the priority groups listed above took place on June 17 2009. These have now been superseded by subsequent meetings of JCVI and SAGE and should not be quoted as the definitive groups]

35. The Committee advised that if supplies permitted, the GSK vaccine should be used in children as no paediatric data are available for the Baxter H5N1 vaccine. The committee needs to consider further whether fever prophylaxis is required in children.

36. The Committee also needs to consider further what dose of the antigen in the GSK vaccine should be given to children from the age of six months. The data from the H5N1 trials showed that children over three years who received the full adult dose had a good immune response but there is increased reactogenicity. Reactogenicity was reduced with half a dose of antigen and adjuvant but immunogenicity was also lower. The committee noted that there were no data for children aged under three years and therefore, only children aged under three years but over six months in clinical risk groups indicated for influenza should receive the GSK vaccine as the benefits would outweigh the risks of vaccination. The committee noted that children should receive two doses of vaccine at least three weeks apart.

37. The committee was asked if future recommendations for the use of the H1N1 vaccine in the UK could be based on the available H5N1 data. The committee noted that in terms of relative immunogenicity between the two pandemic vaccine products, the data cannot be extrapolated. A head-tohead study was being planned to look at the two vaccine products but the committee noted that the study has limited value because the results are unlikely to be available in time to inform

policy. Safety data from the use of the adjuvant in the H5N1 GSK vaccine was relevant to the H1N1 vaccine as this was the same. 7

38. There are no data available on the co-administration of H1N1 'swine flu' vaccines with seasonal influenza vaccine. However, evidence from immunological studies on non-adjuvanted vaccines suggested that it was theoretically possible that seasonal influenza vaccine may interfere with the immune response to the H1N1 'swine flu' vaccine if given at the same time as the first dose of H1N1 'swine flu' vaccine, as this was a novel antigen. The immune response to both vaccines if the seasonal flu vaccine was given at the same time as the second dose of H1N1 'swine flu' vaccine would be similar. Based on the greater antigenic distance between H1N1/2009 and previous seasonal strains and the fact that the H1N1 'swine flu' vaccine will be adjuvanted, the issue of giving the pandemic vaccine and seasonal flu vaccines together on the first dose may not be an issue. The committee advised that the seasonal influenza vaccine could be co-administered with H1N1 pandemic vaccine. The committee advised that the risk of interference was small for vaccines other than seasonal influenza (e.g. HPV) and these could be co-administered.

39. The Committee also considered a paper on influenza in enclosed institutions. There is currently no evidence of clustering of cases in enclosed institutions or that infection is more severe in these settings. Therefore, there is no reason to target particularly these groups for vaccination and only individuals that fall into the target groups outlined above should receive the vaccine.

40. The Advisory Committee on Dangerous Pathogens (ACDP) met last week to discuss the novel influenza H1N1 and the implications for pig and poultry workers. ACDP advised the committee to consider H1N1 vaccination for poultry workers as a precautionary public health measure to guard against the potential risk of the emergence of a new influenza strain, if re-assortment of influenza viruses were to occur in a person co-infected with both human and avian influenza viruses. The ACDP also advised that ACDP has previously advised that there was no need to offer pig workers seasonal influenza vaccination as a precautionary public health measure. There is little evidence to suggest that pigs have a role to play in the transmission of influenza to humans. Though it is known that the H1 and H3 strains of human influenza are circulating in the UK pig herd, the risk of re-assortment of swine and human influenza viruses in a human is considered to be very low. Since this was last discussed in 2006, the situation has not altered, and therefore ACDP reiterated their advice that seasonal influenza vaccination need not be routinely offered to pig workers.

41. The JCVI endorsed this advice and advised that seasonal and H1N1 'swine flu' vaccine should be offered to poultry workers but the vaccination of poultry workers with H1N1 vaccine was considered

a low priority. The Committee also agreed that pig workers should not be offered seasonal or H1N1 'swine flu' vaccine unless they fell into one of the recommended at risk groups. 8

42. The Committee agreed that the only reason not to start a pandemic influenza vaccination programme is if no H1N1 virus was circulating in the UK or other countries. Monitoring developments in the Southern Hemisphere over the next few weeks, where H1N1 infection rates are currently very high, is crucial. Safety monitoring

43. MHRA and HPA provided a paper setting out the pharmacovigilance strategy for pandemic influenza vaccines. Passive surveillance is in place through a web-based pandemic ADR reporting portal. This will run in parallel to the existing yellow card system. GSK and Baxter have agreed to collaborate on a prospective cohort study. The protocol for this study is currently being developed.

44. Previous experience of a swine flu vaccine in the US several decades ago was associated with an increased risk of Guillain-Barre Syndrome. A number of explanations exist for why this occurred including the contamination of eggs used to manufacture the vaccine. Since that time, the use of influenza vaccine has not been associated with Guillain-Barre Syndrome but having an influenza like illness is a known risk factor. The committee thought that the pharmacovigilance could be improved by contacting the Association of British Neurologists and asking if all cases of Guillain-Barre Syndrome could be reported to capture any effects due to either swine flu or any vaccineassociated cases.

Annex 2:

Curriculum Vitae and selected publications

PRESENT APPOINTMENTS:

Associate Fellow, Programme on Global Health, Royal Institute for International Affairs, Chatham House, London. 2014 onwards.

Chair, WHO Global Commission for Certification of Poliomyelitis Eradication; January 2017 onwards.

Chair, WHO Global Commission for Certification of Poliomyelitis Eradication; European Region 2014 onwards.

Senior Fellow, GE2P2 Global Foundation, 2018 onwards.

Board Chair, Jenner Vaccine Foundation, 2012 onwards

Board Member, European Vaccine Initiative, 2012 onwards

Member Board of Trustees, Sabin Vaccine Institute, 2019 onwards.

Visiting Professor, Department of Infectious Disease Epidemiology, Imperial College, University of London. 2007 - present.

Professional memberships

Fellow, Academy of Medical Sciences.

Fellow, Royal College of Physicians.

Fellow, Royal College of Paediatrics and Child Health.

Fellow, Faculty of Public Health.

Liveryman, Worshipful Company of Apothecaries, London

Honours

Companion of the Order of the Bath, Queen's Birthday Honours 2001.

Past Posts

Director of Immunisation (ended 27/12/2013),

Department of Health, London.

National leadership for immunisation programme giving direction for research, strategy, policy, vaccine purchase and implementation.

Department of Health staff responsibilities: administrative, scientific, medical and technical staff.

Department of Health budget responsibilities: Routine budget c£200 million pa, rising to £300 million according to circumstances.

Medical Secretary for the Joint Committee on Vaccination and Immunisation.

INTERNATIONAL APPOINTMENTS – PRESENT / RECENT

Chairman of WHO Global Commission for the Certification of Eradication of Poliomyelitis, 2017 onwards.

(The role of the Commission is to examine the data of all countries of the world to assure that there are no cases of poliomyelitis, that immunisation programmes are sufficiently robust to prevent and detect cases if present, that there are adequate outbreak response measures in place, and that polioviruses are safely secured in manufacturers facilities and in laboratories.)

Chairman of WHO European Commission for the Certification of Eradication of Poliomyelitis, 2007 - present.

Member, WHO Polio Research Committee, 2009 to present.

Chairman, European Vaccine Advisory Group to European Centre for Disease Control (ECDC) 2008 - 2014.

Chairman, Edward Jenner Vaccine Foundation, 2012 – present

(The Edward Jenner Foundation provides resources for a unique collaboration between the Edward Jenner Institute, University of Oxford, and the Institute for Animal Health, Pirbright, to advance scientific knowledge of human and veterinary vaccines.)

Co-Chair, Pandemic Influenza Working Group; Global Health Security Action Group (G7 countries & Mexico). 2004 – 2013.

(The Pandemic Influenza Working Group was set up in 2003 to provide a secure environment in which the G7 countries are able to share their strategic planning for responses to an influenza pandemic. The group was heavily involved in preparation for an

H5N1 pandemic, worked effectively during the H1N1 pandemic and is now active in preparation for H7N9 influenza and for coronavirus.)

President, Governing Council, International Association of Immunisation Managers (IAIM), 2012 – 2017.

IAIM has been set up with a $5million grant from the Bill & Melinda Gates Foundation to provide training, peer-to-peer exchanges and information on immunisation for national immunisation programme managers worldwide.)

Member, Steering Committee, Bill & Melinda Gates Foundation Decade of Vaccines Initiative 2010 - 2012.

(In 2009, Bill & Melinda Gates committed $7billion to support the Decade of Vaccines Initiative (DoV). The Steering Committee developed the Global Action Plan for the DoV, presented it to the World Health Assembly for endorsement and is now charged with its implementation.)

Chairman, Research & Development Working Group, Bill & Melinda Gates Foundation Decade of Vaccines Initiative, 2010 - 2012.

(See above. The R&D Working Group produced the road map for development and introduction of new vaccines targeted for the next decade.)

Member, WHO Eastern Mediterranean Commission for the Certification of Eradication of Poliomyelitis, 2003 – 2017

(See European Commission for Certification of Poliomyelitis eradication).

Member, WHO South East Asia Commission for the Certification of Eradication of Poliomyelitis, 2008 – 2017

(See European Commission for Certification of Poliomyelitis eradication).

Chair, WHO Technical Advisory Committee on Poliomyelitis Eradication, Pakistan, 2012 to 2013.

Member, Vaccine Advisory Committee, Malaria Vaccine Initiative, Program for Applied Technology in Health, 2008 – 2016

Member, Malaria Advisory Panel, Bill and Melinda Gates Foundation, 2011 - 2016

Chairman, Strategic Advisory Group of Experts (SAGE) on Vaccines and Biologicals to World Health Organization 2005 - 2010.

(SAGE is the highest level advisory group on global vaccination that reports directly to the Director General of WHO. Chairmanship of SAGE coincided with the national, regional and global preparations for an H5N1 influenza pandemic and the occurrence of the H1N1 influenza pandemic. Period of Chairmanship involved major changes in the ways in which vaccination advice was produced and promulgated by WHO making SAGE an internationally accepted source of global leadership in vaccination.)

Personal professional achievements

Department of Health lead for introduction of rotavirus vaccine, varicella zoster vaccine, meningococcal C vaccine (for adolescents), influenza vaccine for children, 2013 onwards.

Department of Health lead for MMR catch up campaign 2013 onwards.

Department of Health lead for introduction of pertussis vaccines for pregnant women 2012 onwards.

Department of Health lead for introduction of influenza vaccine for pregnant women 2011 onwards.

Department of Health lead for introduction of pneumococcal conjugate vaccine, 2006.

Department of Health lead for vaccination for Influenza Pandemic Preparedness (Global Health Security Initiative) 2006 onwards.

Department of Health lead for introduction of HPV vaccine 2006 onwards.

Development and implementation of Hib catch-up campaign 2003.

Chairman of WHO Director General's Review Group on Polio Eradication Initiative, 2001-2002.

Department of Health focal point for MMR defence, 1994 to 2014.

Development, strategy and introduction of meningitis C vaccine campaign, 1994 – 2000.

Introduction of routine second dose MMR programme 1996.

Anticipation of national measles epidemic, development and implementation of MR vaccine campaign 1994.

Strategy, introduction and implementation of Hib vaccine programme 1992.

Design and introduction of accelerated immunisation schedule 1990.

Strategy design and policy implementation of MMR programme 1988.

Additional professional activities:

Referee: Lancet, British Medical Journal, Vaccine, Journal of Infectious Diseases, Public Health, Epidemiology, European Journal of Epidemiology, Bulletin of World Health Organization, Archives of Internal Medicine, Journal of Public Health Policy, Risk Analysis, Vaccines.

Proposal reviewer: Bill and Melinda Gates Foundation, Medical Research Council, Wellcome Trust, Royal Society, Program for Applied Technology in Health.

Member, World Economic Forum Global Agenda Council on Pandemics, 2008 -.

Member, US Centers for Disease Control Advisory Committee on Immunization Practice Meningococcal Vaccine Work Group.

Advisor to Supervisory Board, Netherlands Vaccine Institute, Netherlands.

Member Editorial Board, Journal of Human Vaccines.

Member of Faculty, Advanced Vaccinology Course, 1999 to present.

Liaison Member, US Advisory Committee on Immunization Practice.

Liaison Member, US National Vaccine Advisory Committee.

Member, Expert Advisory Group on Meningococcal Vaccine Project, Gates Foundation.

Additional professional activities: Past

Advisor on immunisation to Governments of Canada, Australia, Netherlands, Belgium, France, Brazil, Argentina, United States, New Zealand.

Member: Vaccine Procurement Subgroup of Financing Taskforce, Global Alliance for Vaccines and Immunisation.

Member WHO Global Advisory Committee on Vaccine Safety
(GACVS)

Member: WHO European Region Poliomyelitis Consultancy Group

Secretary: WHO European Region Commission of Certification of Poliomyelitis eradication.

Member: Strategic Planning and Priority Setting Task Force, Children's' Vaccine Initiative.

Member: Management Advisory Committee, Children's Vaccine Initiative.

Chairman: Advocacy Task Force, Children's Vaccine Initiative.

Member, Product Development Group for Thermostable Polio vaccine, Children's Vaccine Initiative.

Chairman: WHO Rubella immunisation advisory group.

Chairman: WHO measles surveillance advisory group.

Member: European Forum on Immunisation.

Rapporteur/Member: European Advisory Group on Immunisation, World Health Organisation.

Rapporteur/Member: Global Advisory Group on the Expanded Programme on Immunisation, World Health Organisation.

Advisor to WHO Scientific Advisory Group of Experts on Immunisation.

Member of European Parliament Scientific and Technical Options Assessment on Vaccines.

Member, EC Project on Methodologies in Immunisation.

Consultant Adviser to WHO EURO for EUROHEALTH.

Member British Paediatric Association Immunisation and Infectious Diseases Group.

Further Professional Activities:

Referee: Lancet, British Medical Journal, Vaccine, Journal of Infectious Diseases, Public Health, Epidemiology, European Journal of Epidemiology, Bulletin of World Health Organization, Archives of Internal Medicine, Journal of Public Health Policy, Risk Analysis, Vaccines.

Proposal reviewer: Bill and Melinda Gates Foundation, Medical Research Council, Wellcome Trust, Royal Society, Program for Applied Technology in Health.

Member, World Economic Forum Global Agenda Council on Pandemics, 2008 -.

Member, US Centers for Disease Control Advisory Committee on Immunization Practice Meningococcal Vaccine Work Group.

Advisor to Supervisory Board, Netherlands Vaccine Institute, Netherlands.

Member Editorial Board, Journal of Human Vaccines.

Member of Faculty, Advanced Vaccinology Course, 1999 to present.

Liaison Member, US Advisory Committee on Immunization Practice.

Liaison Member, US National Vaccine Advisory Committee.

Member, Expert Advisory Group on Meningococcal Vaccine Project, Gates Foundation.

Selected Publications

2023

Vaccines for a sustainable planet
Simone Pecetta, Arindam Nandi, Charlie Weller, Vanessa Harris, Helen Fletcher, Francesco Berlanda Scorza, Mariagrazia Pizza, **David Salisbury**, Richard Moxon, Steve Black, David E. Bloom, Rino Rappuoli.
Sci. Transl. Med. 15, eadf1093 (2023) 1 March 2023. DOI: 10.1126/scitranslmed.adf1093.
https://www.science.org/doi/10.1126/scitranslmed.adf1093

The Societal Value of Vaccines: Expert-Based Conceptual Framework and Methods Using COVID-19 Vaccines as a Case Study.
Di Fusco, M.; Mendes, D.; Steuten, L.; Bloom, D.E.; Drummond, M.; Hauck, K.; Pearson-Stuttard, J.; Power, R.; **Salisbury, D.;** Towse, A.; et al. Vaccines 2023, 11, 234.
https://doi.org/ 10.3390/vaccines11020234

2022

Capturing the value of vaccination within health technology assessment and health economics: Literature review and novel conceptual framework.

Beck E, Biundo E, Devlin N, Doherty TM, Garcia-Ruiz AJ, Postma M, Sheikh S, Smela B, Toumi M, Wasem J, Nolan T, **Salisbury D**. Vaccine. 2022 Jun 26;40(30):4008-4016. doi: 10.1016/j.vaccine.2022.04.050. Epub 2022 May 23.PMID: 35618559

Country score tool to assess readiness and guide evidence generation of immunization programs in aging adults in Europe.

Pham TH, Beck E, Postma MJ, Németh B, Ágh T, de Waure C, **Salisbury DM**, Nutma N and van der Schans J (2023) Front. Public Health 10:1080678. doi: 10.3389/fpubh.2022.1080678

2021

The challenges of distributing COVID-19 vaccinations.

Mills MC, **Salisbury D**. EClinicalMedicine. 2021 Jan;31:100674. doi: 10.1016/j.eclinm.2020.100674. Epub 2020 Dec 8. PMID: 33319186

2020

Global Vaccine Action Plan Lessons Learned I.

SAGE Decade of Vaccines Working Group

MacDonald N, Mohsni E, Al-Mazrou Y, Andrus J, Arora N, Elden S, Madrid M-Y, Martin R, Mahmoud Mustafa A, Rees H, **Salisbury D**, Zhao Q, Jones I, Steffen C, Hombach J, O'Brien K, Cravioto A.

https://doi.org/10.1016/j.vaccine. 2020.05.003

2019

Economic evaluation of meningococcal vaccines: considerations for the future.

Christensen H, Al-Janabi H, Levy P, Postma MJ, Bloom DE, Landa P, Damm O, **Salisbury DM**, Diez-Domingo J, Towse AK, Lorgelly PK, Shah KK, Hernandez-Villafuerte K, Smith V, Glennie L, Wright C, York L, Farkouh R.

Eur J Health Econ. 2019 Nov 21. doi: 10.1007/s10198-019-01129-z.

PMID:31754924

The life-course approach to vaccination: Harnessing the benefits of vaccination throughout life.

Tate J, Aguado T, Belie J, Holt D, Karafillakis E, Larson HJ, Nye S, **Salisbury D**, Votta M, Wait S.

Vaccine. 2019 Oct 16;37(44):6581-6583. doi: 10.1016/j.vaccine.2019.09.016. Epub 2019 Sep 23.

PMID:31558327

Two centuries of immunisation in the UK (part 1).

Lang S, Loving S, McCarthy ND, Ramsay ME, **Salisbury D**, Pollard AJ.

Arch Dis Child. 2019 Jul 4. pii: archdischild-2019-317314. doi: 10.1136/archdischild-2019-317314. PMID:31272966

Two centuries of immunisation in the UK (part II).

Lang S, Loving S, McCarthy ND, Ramsay ME, **Salisbury D**, Pollard AJ.

Arch Dis Child. 2019 Jul 13. pii: archdischild-2019-317707. doi: 10.1136/archdischild-2019-317707. PMID:31302603

2018

Vaccine candidates for poor nations are going to waste.

Kaslow DC, Black S, Bloom DE, Datla M, **Salisbury D**, Rappuoli R.

Nature. 2018 Dec;564(7736):337-339. doi: 10.1038/d41586-018-07758-3..

PMID:30560957

Antimicrobial resistance and the role of vaccines.

Bloom DE, Black S, **Salisbury D**, Rappuoli R.

Proc Natl Acad Sci USA. 2018 Dec 18;115(51):12868-12871. doi: 10.1073/pnas.1717157115. PMID:30559204

Lessons from an Online Vaccine Communication Project

Finnegan G, Holt D, English P, Glismann S, Thomson A, **Salisbury D**, Bogaerts H, Bonanni P. Vaccine 2018. https://doi.org/10.1016/j.vaccine.2018.05.007

2017

Enhancing the role of vaccines in combatting antimicrobial resistance.

Clift C, **Salisbury DM.**

Vaccine. 2017 Dec 4;35(48 Pt B):6591-6593. doi: 10.1016/j.vaccine.2017.09.053.

2016

Contributions and challenges for worldwide vaccine safety: The Global Advisory Committee on Vaccine Safety at 15 years.

Asturias EJ, Wharton M, Pless R, MacDonald NE, Chen RT, Andrews N, **Salisbury D**, Dodoo AN, Hartigan-Go K, Zuber PL.

Vaccine. 2016 Jun 17;34(29):3342-9. doi: 10.1016/j.vaccine.2016.05.018.

2015

Eradicating polio.

Adams A, **Salisbury DM**.

Science. 2015 Nov 6;350(6261):609. doi: 10.1126/science.aad7294.

2014

Simulation exercises to strengthen polio outbreak preparedness: experience of the World Health Organization European Region.

Moulsdale HJ, Khetsuriani N, Deshevoi S, Butler R, Simpson J, **Salisbury D**.

J Infect Dis. 2014 Nov 1;210 Suppl 1:S208-15. doi: 10.1093/infdis/jiu120.

2012

Translating vaccine policy into action: A report from the Bill & Melinda Gates Foundation Consultation on the prevention of maternal and early infant influenza in resource-limited settings.

Ortiz JR, Neuzil KM, Ahonkhai VI, Gellin BG, **Salisbury DM**, Read JS, Adegbola RA, Abramson JS.

Vaccine. 2012 Sep 29. doi:pii: S0264-410X(12)01345-X. 10.1016/j.vaccine.2012.09.034.

Should childhood vaccination be mandatory? No.

Salisbury DM.

BMJ. 2012 May 15;344:e2435. doi: 10.1136/bmj.e2435.

2011

Vaccines and Global Health.

Greenwood B, **Salisbury D**, Hill AVS.

Phil. Trans. R. Soc. B (2011). 366, 2733 – 2742.

Establishing global policy recommendations: the role of the Strategic Advisory Group of Experts on immunization.

Duclos P, Okwo-Bele JM, **Salisbury D**.

Expert Rev Vaccines. 2011 Feb;10(2):163-73.

2009

Public health. Rethinking influenza.

Rappuoli R, Del Giudice G, Nabel GJ, Osterhaus AD, Robinson R, **Salisbury D**, Stöhr K, Treanor JJ.

Science. 2009 Oct 2;326(5949):50.

Collection of routine national seasonal influenza vaccine coverage data from GP practices in England using a web-based collection system.

Gates P, Noakes K, Begum F, Pebody R, **Salisbury D.**

Vaccine. 2009 Nov 12;27(48):6669-77. Epub 2009 Sep 9.

Immunisation in the U.K.: protected for the future.

Salisbury D.

Clin Med. 2009 Jun;9(3):261-3.

Meningococcal C conjugate vaccine: The experience in England and Wales

Campbell H, Borrow R, **Salisbury D** and Miller E.
http://dx.doi.org/10.1016/j.vaccine.2009.04.067.

DOI: 10.1016/j.vaccine.2009.04.067

2008

Influenza vaccination coverage in England, 2000-2008.

Pebody RG, Begum F, Gates P, Noakes K, **Salisbury D**.

Euro Surveill. 2008 Dec 18;13(51). pii: 19074;

Flu: Younger risk groups.

Practice Nursing 2008, 19; 10: 505-507.

Noakes K and **Salisbury D**.

2007

Tracking mothers' attitudes to MMR immunisation 1996–2006 .
Smith A, Yarwood J and **Salisbury DM**.

Vaccine, 2007. 25(20):3996-4002.

A global pandemic influenza vaccine action plan.

Kieny M P, Costa A, Hombach J, Carrasco P, Pervikov Y, **Salisbury D**, Greco M, Gust I, LaForce M, Franco-Paredes C et al

Vaccine. 2006. 24; 40-41: 6367-6456.

Compulsory vaccinations and conscientious or philosophical exemptions: past, present or future.

Salmon DA, Teret SP, MacIntyre R, **Salisbury D M**, Burgess MA, Halsey NA. Lancet. 2006 Feb 4;367(9508):436-42.